

CLAIM AMENDMENTS

Please amend the claims as described below. In accordance with 37 CFR §1.121, a complete listing of all claims in the application is provided below. Notably, the status of each claim is indicated in the parenthetical expression adjacent to the claim number.

1 1. **(Currently Amended)** A sensor unit for sensing process parameters of a
2 process to manufacture an integrated circuit using integrated circuit processing equipment,
3 the sensor unit comprising:

4 a substrate having a wafer or wafer-like shape ~~shaped profile~~;

5 a first sensor, disposed on or in the substrate, to sample a first process
6 parameter; and

7 a second sensor, disposed on or in the substrate, to sample a second
8 process parameter, wherein the second process parameter is different from the first
9 process parameter and the second sensor is a different type of sensor from the first
10 sensor.

1 2. **(Currently Amended)** The sensor unit of claim 1 further including at least one
2 battery, disposed on or in the ~~wafer-shaped~~ substrate, to provide electrical power to the first
3 sensor.

1 3. **(Previously Presented)** The sensor unit of claim 1 further including
2 communications circuitry disposed on the substrate, wherein the communications circuitry
3 is coupled to the first and second sensors to provide data to an external device wherein the
4 data is representative of the first and second process parameters.

1 4. **(Previously Presented)** The sensor unit of claim 1 further including a first
2 source, disposed on or in the substrate, wherein first source generates an interrogation
3 signal and wherein the first sensor uses the interrogation signal from the first source to
4 sample the first process parameter.

1 5. **(Previously Presented)** The sensor unit of claim 4 further including a second
2 source, disposed on or in the substrate, wherein second source generates an interrogation
3 signal and wherein the second sensor uses the interrogation signal from the second source
4 to sample the second process parameter.

1 6. **(Previously Presented)** The sensor unit of claim 4 wherein the first sensor and
2 first source operate in an end-point mode.

1 7. **(Previously Presented)** The sensor unit of claim 6 wherein the second sensor
2 operates in a real-time mode.

1 8. **(Previously Presented)** The sensor unit of claim 7 further including data storage
2 to store data which is representative of the second parameter.

1 9. **(Previously Presented)** The sensor unit of claim 7 wherein the sensor unit
2 further includes:
3 data compression circuitry to compress the data which is representative of
4 the second parameter;

5 communication circuitry, coupled to the data compression circuitry, to provide
6 the data which is representative of the second parameter to external circuitry; and
7 at least one rechargeable battery, to provide electrical power to the data
8 compression circuitry and the communication circuitry.

1 10. **(Previously Presented)** The sensor unit of claim 1 wherein the first sensor
2 operates in a real-time mode.

1 11. **(Previously Presented)** The sensor unit of claim 10 further including:
2 data storage to store data which is representative of the first parameter;
3 data compression circuitry to compress the data which is representative of
4 the first parameter;
5 communication circuitry, coupled to the data compression circuitry, to provide
6 the data which is representative of the first parameter to external circuitry; and
7 at least one rechargeable battery, to provide electrical power to the data
8 compression circuitry and the communication circuitry.

1 12. **(Previously Presented)** The sensor unit of claim 10 wherein the first sensor
2 samples the first parameter periodically or continuously while the sensor unit is disposed in
3 the integrated circuit processing equipment and undergoing processing.

1 13. **(Previously Presented)** The sensor unit of claim 1 wherein the first sensor is a
2 temperature sensor and the second sensor is a pressure sensor.

1 14. **(Previously Presented)** The sensor unit of claim 1 wherein the first sensor is a
2 temperature sensor and the second sensor is a chemical sensor.

1 15. **(Previously Presented)** The sensor unit of claim 1 wherein the first sensor is a
2 temperature sensor and the second sensor is a surface tension sensor.

1 16. **(Previously Presented)** The sensor unit of claim 1 wherein the first sensor is a
2 temperature sensor and the second sensor is a surface stress sensor.

1 17. **(Currently Amended)** A sensor unit for sensing a first process parameter of a
2 process to manufacture an integrated circuit using integrated circuit processing equipment,
3 the sensor unit comprising:
4 a substrate having a wafer or wafer-like shape ~~shaped profile~~;
5 a source, disposed on or in the substrate, to generate an interrogation signal;
6 and
7 a first sensor, disposed on or in the substrate, to sample a first process
8 parameter using the interrogation signal from the source.

1 18. **(Previously Presented)** The sensor unit of claim 17 wherein the source and
2 the first sensor operate in an end-point mode.

1 19. **(Previously Presented)** The sensor unit of claim 17 wherein the source and
2 the first sensor operate in a real-time mode.

1 20. **(Previously Presented)** The sensor unit of claim 19 further including data
2 storage to store data which is representative of the first parameter.

1 21. **(Previously Presented)** The sensor unit of claim 19 wherein the sensor unit
2 further includes:

3 data compression circuitry to compress the data which is representative of
4 the first parameter;

5 communication circuitry, coupled to the data compression circuitry, to provide
6 the data which is representative of the first parameter to external circuitry; and

7 at least one rechargeable battery, to provide electrical power to the data
8 compression circuitry and the communication circuitry.

1 22. **(Previously Presented)** The sensor unit of claim 17 wherein the source is a
2 VCSEL or LED.

1 23. **(Previously Presented)** The sensor unit of claim 22 wherein the first sensor is
2 a CMOS devices, charge coupled devices, or photodiode.

1 24. **(Previously Presented)** The sensor unit of claim 23 wherein the first parameter
2 is the surface profile.

1 25. **(Previously Presented)** The sensor unit of claim 23 wherein the sensor unit
2 further includes a predetermined surface layer which is disposed above the source and the
3 first sensor.

1 26. **(Previously Presented)** The sensor unit of claim 25 wherein the predetermined
2 surface layer is comprised of a material that facilitates light propagation or scattering.

1 27. **(Previously Presented)** The sensor unit of claim 17 wherein the first sensor
2 periodically or continuously samples the first parameter while the sensor unit is disposed in
3 the integrated circuit processing equipment and undergoing processing.

1 28. **(Previously Presented)** The sensor unit of claim 27 further including data
2 storage, coupled to the first sensor, to store data which is representative of the first
3 parameter.

1 29. **(Currently Amended)** The sensor unit of claim 27 wherein the sensor unit
2 further includes:

3 communication circuitry, coupled to the first sensor ~~data-compression~~
4 ~~circuitry~~, to provide the data which is representative of the first parameter to external
5 circuitry; and

6 at least one rechargeable battery, to provide electrical power to ~~the data~~
7 ~~compression circuitry~~ and the communication circuitry.

1 30. **(Previously Presented)** The sensor unit of claim 29 wherein:

2 the source is a VCSEL or LED;

3 the first sensor is a CMOS devices, charge coupled devices, or photodiode;

4 and

5 wherein the sensor unit further includes a predetermined surface layer which

6 is disposed above the source and the first sensor.

1 31. **(Previously Presented)** The sensor unit of claim 30 wherein the first sensor

2 samples the intensity of reflected or scattered light.

1 32. **(Previously Presented)** The sensor unit of claim 31 further including a

2 temperature sensor to sample temperature, in a real-time mode, while the sensor unit is

3 disposed in the integrated circuit processing equipment and undergoing processing.

1 33. **(Currently Amended)** The sensor unit of claim 32 wherein the temperature

2 sensor periodically or continuously samples the temperature while the sensor unit is

3 disposed in the integrated circuit processing equipment and undergoing processing.

1 34. **(Currently Amended)** A sensor unit for sensing a-first and second process

2 parameters of a process to manufacture an integrated circuit using integrated circuit

3 processing equipment, the sensor unit comprising:

4 a substrate having a wafer or wafer-like shape ~~shaped profile~~;

5 a first source, disposed on or in the substrate, to generate an interrogation
6 signal; ~~and~~

7 a first sensor array including a plurality of first sensors disposed on or in the
8 substrate, wherein the first sensors sample the a first process parameter using the
9 interrogation signal; and

10 a second sensor array including a plurality of second sensors disposed on or
11 in the substrate, wherein the second sensors sample the a second process
12 parameter, and wherein the second process parameter is different from the first
13 process parameter and the second sensors are different types of sensors from the
14 first sensors.

1 35. **(Previously Presented)** The sensor unit of claim 34 wherein the second
2 sensors operate in a end-point mode.

1 36. **(Previously Presented)** The sensor unit of claim 34 wherein the second
2 sensors operate in a real-time mode and sample the second process parameter
3 continuously or periodically while the sensor unit is disposed in the integrated circuit
4 processing equipment and undergoing processing.

1 37. **(Previously Presented)** The sensor unit of claim 34 wherein the first source
2 and the first sensors operate in an end-point mode.

1 38. **(Previously Presented)** The sensor unit of claim 34 wherein the first source
2 and the first sensors operate in a real-time mode.

1 39. **(Currently Amended)** The sensor unit of claim 38 further including:
2 data storage to store data sampled by the first sensors;
3 communication circuitry, coupled to the data storage, to provide the data
4 sampled by the first sensors ~~which is representative of the first parameter~~ to external
5 circuitry; and
6 at least one rechargeable battery, to provide electrical power to the first
7 source, the first sensors, and the data storage ~~and the communication circuitry~~.

1 40. **(Currently Amended)** The sensor unit of claim 38 wherein:
2 the first source is a VCSEL or LED;
3 the first ~~sensor~~ sensors are ~~is a~~ CMOS devices, charge coupled devices, or
4 photodiode; and
5 wherein the sensor unit further includes a predetermined surface layer which
6 is disposed above the first source and the first sensors ~~sensor~~.

1 41. **(Currently Amended)** The sensor unit of claim 40 wherein the first sensors
2 sample ~~sensor~~ ~~samples~~ the intensity of reflected or scattered light.

1 42. **(Previously Presented)** The sensor unit of claim 41 wherein the second
2 sensors are temperature sensors.

1 **43. (Previously Presented)** The sensor unit of claim 42 wherein the temperature
2 sensors sample temperature, in a real-time mode, while the sensor unit is disposed in the
3 integrated circuit processing equipment and undergoing processing.

1 **44. (Previously Presented)** The sensor unit of claim 43 wherein the temperature
2 sensors periodically or continuously sample the temperature.

1 **45. (Previously Presented)** The sensor unit of claim 34 wherein the second
2 sensors are pressure sensors.

1 **46. (Previously Presented)** The sensor unit of claim 34 wherein the second
2 sensors are light intensity sensors.

1 **47. (Previously Presented)** The sensor unit of claim 34 wherein the second
2 sensors are chemical sensors.

1 **48. (Previously Presented)** The sensor unit of claim 34 wherein the second
2 sensors are surface tension sensors.

1 **49. (Previously Presented)** The sensor unit of claim 34 wherein the second
2 sensors are surface stress sensors.

1 50. **(Previously Presented)** The sensor unit of claim 34 wherein the second
2 sensors are surface profile sensors.